



The EAMENA and MarEA Projects: Notes on Current Training and Research in Libya and Beyond

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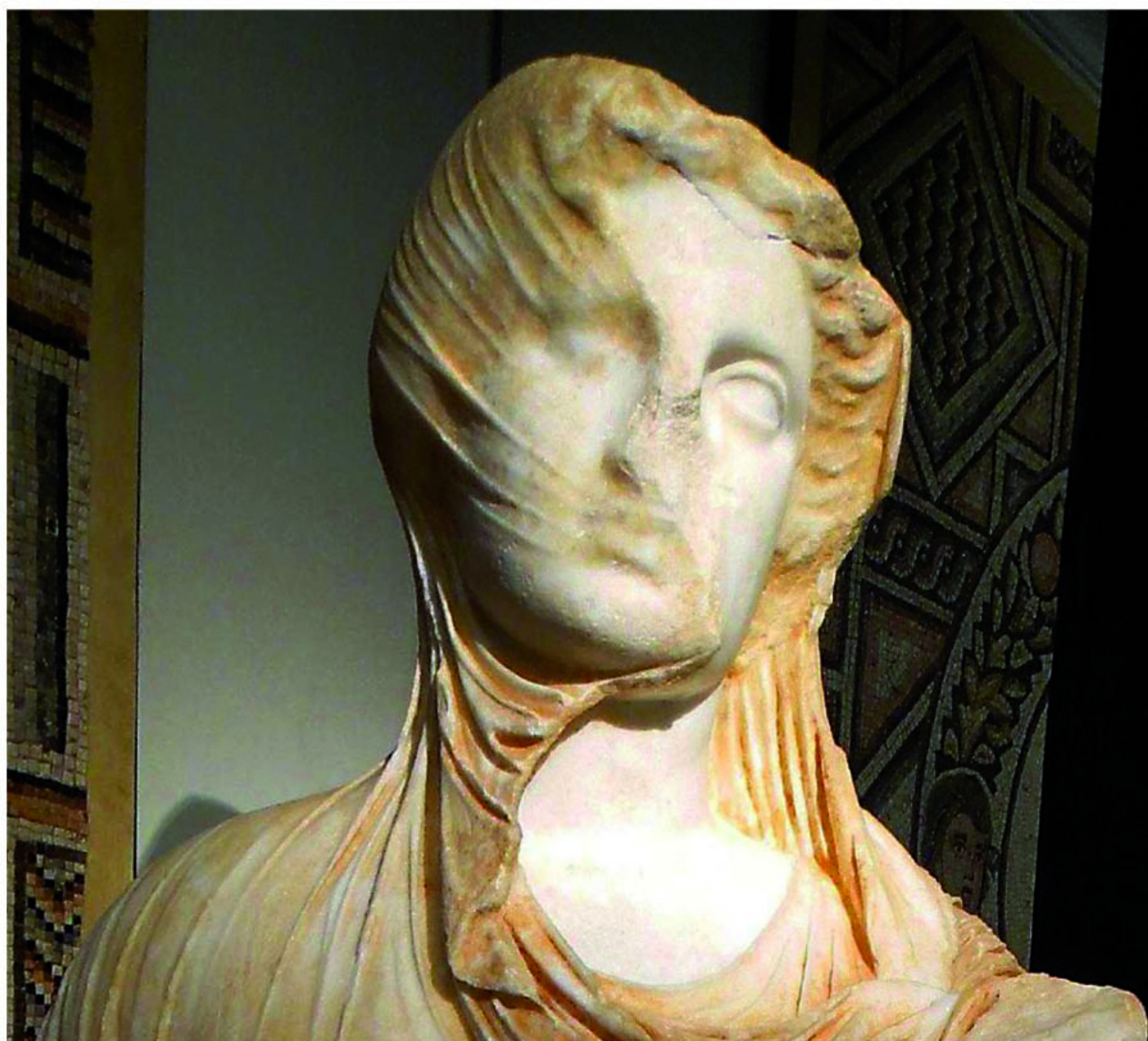
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INDICE

OLIVA MENOZZI

Editoriale

Beni culturali in Libia oggi tra consapevolezza, salvaguardia, rischi antropici e naturali alla luce delle esperienze presentate al convegno di Chieti *Behind the Buffer Zones. Archaeology at Risk & Illicit Traffic of Antiquities*

7

ARTICOLI E NOTE

MOHAMED OMAR M. ABDREBBA

Road Networks in Cyrenaica during the Greek and Roman Periods: Cyrene in Context

17

MORGAN BELZIC

'La Belle Endormie'. Une divinité funéraire de Cyrénaïque saisie à New York

25

OSCAR MEL, SIMONA ANTOLINI

Archeologia ed epigrafia a Cirene in tempi di crisi: nuovi rinvenimenti dalla *chora* e dalla Necropoli Sud

45

FILIPPO VENTURINI

Un mosaico con scena rituale da Berenice (Bengasi)

65

MAHMOUD KHALIFA HADIA

Sidi Mohamed Sherif Site (Lepcis Magna Coastal Area)

75

SUFYAN AL-DABEEB

The Effect of Roman Civilization in Bani Walid Area

85

ANDREA ZOCCHI, LAURA BUCCINO

Lo strano caso della testa marmorea rinvenuta nel fiume Hudson: Leptis Magna sulle pagine de *The New York Times* negli anni Venti del Novecento

93

RASSEGNA DI STORIA DEL NORD AFRICA
a cura di MARCO MAIURO

NICOLETTA DE TROIA

Identità e mobilità in età tardoantica: la fascia presahariana lungo i confini dell'Africa romana 133

ARCHIVI E RISORSE DIGITALI PER IL PATRIMONIO STORICO
E ARCHEOLOGICO DEL NORD AFRICA
a cura di LUISA MUSSO

MARINA GALLINARO

The ASArt-DATA Project: Current Perspectives on Central Saharan Rock Art 157

CATHERINE DOBIAS-LALOU, ALICE BENCIVENNI

IGCyr - GVCyr: un doppio *corpus* di iscrizioni greche della Cirenaica on-line 167

ATTUALITÀ. TUTELA, FORMAZIONE, CONVEGNI ED EVENTI
a cura della Redazione

AHMED HUSSEIN Y. ABDULKARIEM

Intervention at Archaeological Sites in the Time of Crisis and War. Qasr Libya Site as a Model 173

MARIA GIORGIA DI ANTONIO, ABDULRAHIM SALEH SHARIFF

La *chora* di Cirene: aggiornamenti su monitoraggio, *survey* e studio delle *buffer zones*
a cura del *team* congiunto del Dipartimento di Antichità della Libia (DoA) e della Missione
Archeologica dell'Università di Chieti 179

ABDULADIM NATTAH

The Libyan-Italian Cooperation between the Center for Libyan Archives and Historical Studies
(CLArHS), the Department of Antiquities of Libya (DoA) and the Archaeological Mission
of Università Roma Tre 187

OSCAR MEI

Gastone Buttarini (1949-2019): mezzo secolo di restauri in Libia 189

BARBARA DAVIDDE PETRIAGGI

L'attività dell'Istituto Centrale per il Restauro (ICR) in Libia: conservazione e formazione 197

JULIA NIKOLAUS, LOUISE RAYNE, NICHOLE SHELDRICK

The EAMENA and MarEA Projects: Notes on Current Training and Research in Libya
and Beyond 203

ELENA CALANDRA	
L'Istituto Centrale per l'Archeologia (ICA) e le missioni italiane all'estero	207
GIUSEPPINA CAPRIOTTI VITTOZZI	
<i>Italian Archaeology in Egypt and MENA Countries</i> (IAM 1 and 2). Archaeological Conference, Cairo-Alexandria, December 7-9, 2017; Cairo, December 5-8, 2018	211
ANDREA ZOCCHI	
<i>LyDAr Database. Aims and Features</i> . Workshop, Tripoli, November 15, 2018	213
LAURA BUCCINO, MUSTAFA ABDULLAH TURJMAN, ANDREA ZOCCHI	
<i>The Department of Antiquities of Libya and the Italian Archaeological Missions Working in Libya</i> . Meeting, Rome, Libyan Academy, September 16, 2019	217

The EAMENA and MarEA Projects: Notes on Current Training and Research in Libya and Beyond

Julia Nikolaus, Louise Rayne, Nichole Sheldrick

This article provides an update on the work the “Endangered Archaeology in the Middle East and North Africa” (EAMENA) project has conducted in Libya over the last year. It also introduces a new project, the “Maritime Endangered Archaeology” (MarEA) which was established in partnership with EAMENA. Both, EAMENA and MarEA, focus on mapping, recording and monitoring archaeological sites across multiple MENA countries, including Libya. Both projects aim to provide tools for remote mapping, interpreting and recording archaeological sites that will prove useful in capacity building in the MENA region. Between November 2017 and March 2019, three, two-week long EAMENA-Cultural Protection Fund training workshops took place in Tunis (Tunisia), in which 20 Libyan archaeologists and heritage professionals took part.

THE “ENDANGERED ARCHAEOLOGY OF THE MIDDLE EAST AND NORTH AFRICA” (EAMENA) PROJECT

The EAMENA project was established in 2015 to identify, document, and monitor damage and threats to archaeological sites in the MENA region¹. The project uses a combination of remote sensing techniques, archival research, and field visits to conduct analyses and assessments of the features and condition of sites, which are recorded in the EAMENA database². The database has been customised using the open-source, Arches v.3 heritage management platform, developed by the Getty Conservation Institute and World Monuments Fund, and is an open-access resource³.

As of March 2020, the EAMENA database currently holds more than 290,000 records overall, from Mauritania to Iran, nearly 10,000 of which re-

cord sites in Libya⁴. The EAMENA project is working on a number of on-going projects in different areas of Libya. One such project is the digitisation of the sites of the UNESCO Libyan Valleys Archaeological Survey⁵, which, when incorporated into the EAMENA database, will act as an updated GIS for the survey and include recent assessments of the condition of the sites. Also ongoing are projects to digitise and monitor the World Heritage Site of Cyrene and its hinterland⁶ and another to document the heritage of the al-Jufra oases in the Sahara.

Between November 2017 and March 2019, three, two-week long EAMENA-Cultural Protection Fund (CPF) training workshops were held in Tunis (Tunisia). Over the course of the first two workshops, 20 Libyan archaeologists and heritage professionals from various parts of the country were trained in

¹ BEWLEY *et al.* 2016.

² <http://database.eamena.org>.

³ Users can register for full access at the following link: <http://eamena.arch.ox.ac.uk/database-registration-form/>. In general see

ZERBINI 2018.

⁴ RAYNE, SHELDRIK, NIKOLAUS 2017. See also NIKOLAUS *et al.* 2018.

⁵ BARKER *et al.* 1996.

⁶ RAYNE *et al.* 2017.

introductory GIS (Geographical Information Systems), remote sensing techniques and the EAMENA methodology of identifying and recording sites. Half of these participants, 10, returned for the third and final advanced training workshop⁷. The goal of the workshops was to provide Libyan archaeologists with new skills and resources that will aid them in the conservation and protection of their heritage.

During the basic training workshops, participants learned how to identify archaeological sites and interpret satellite imagery using free platforms such as Google Earth Pro. Detailed instruction on how to input data on the archaeological details and condition of sites into the EAMENA database was a key skill that was developed. Participants were then taught to use QGIS to conduct basic analyses and create maps; instruction on field recording and training in the use of handheld GPS units was also provided during a field trip to a local archaeological site. During the advanced training, participants were given the chance to improve their skills with the database and QGIS, and were instructed in more advanced techniques of analysis, such as the use of Google Earth Engine⁸.

EAMENA AUTOMATED MONITORING OF DAMAGE AND DESTRUCTION

Over the last year, the EAMENA team has started to develop a script using Google Earth Engine that is designed to alert heritage professionals about damage to sites in their region such as agricultural expansion or construction. Google Earth Engine is a platform which supplies regularly updated free satellite imagery and high-performance computing⁹. Machine learning and classification algorithms are applied to freely available and regularly collected satellite images which detect changes in agricultural and urban extents much more rapidly than manual human interpretation alone. Heritage professionals and archaeologists from Libya received basic training in using Google Earth Engine as part of the EAMENA-CPF advanced training workshop mentioned above. For example, our algorithms highlighted the urgency of protecting sites in the al-Jufra oases of Libya, because they are currently threatened by agricultural expansion (Fig. 1). Over the past 20 years, 47 of the 90 recorded sites in al-Jufra have been damaged or destroyed by modern agricultural activity.

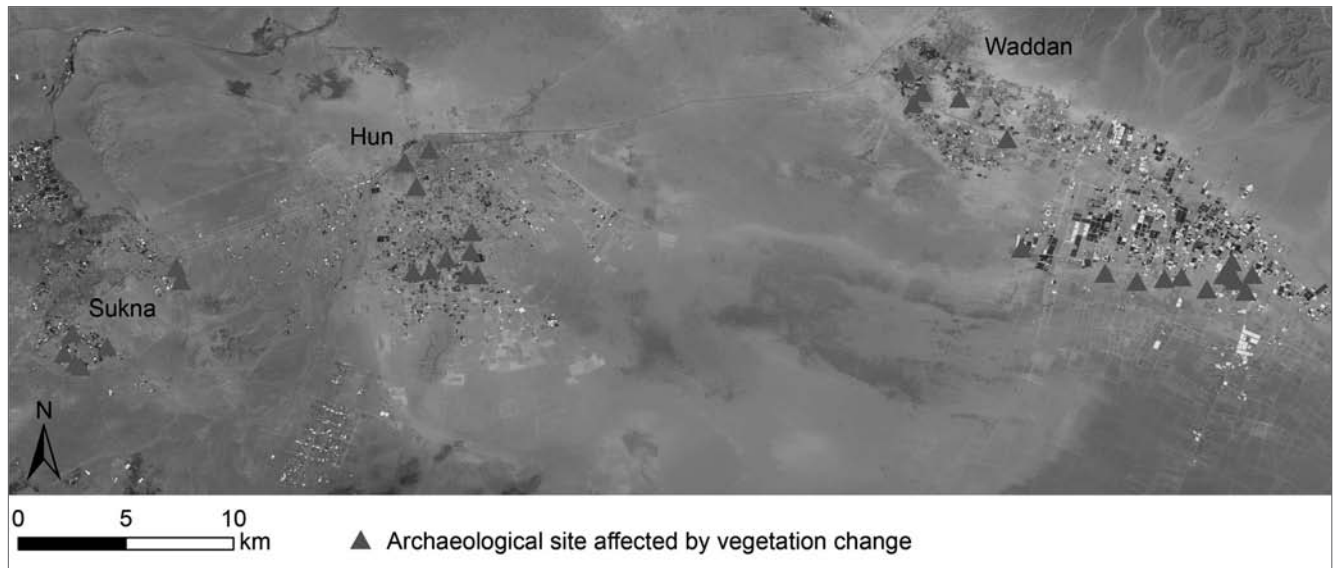


FIG. 1 - Extent of area in which vegetation has changed between 2016 and 2019 overlain on Sentinel-2 composite from 2019. Changed area was derived from the difference between vegetation indices in the al-Jufra oases applied to Sentinel-2 images. Sites encompassed by the changed area are highlighted. Contains modified Copernicus Sentinel data 2016/2019.

⁷ HOBSON 2019.

⁸ See *infra*, p. 205.

⁹ GORELICK *et al.* 2017.

THE “MARITIME ENDANGERED ARCHAEOLOGY” PROJECT (MARÉA)

In 2019 the MarEA project was established in partnership with the EAMENA project. The coastal zone in the MENA region is under severe threat from natural and human impacts. In Libya, the famous coastal sites of Sabratha, Lepcis Magna and Apollonia are under threat from coastal erosion and sea level changes, which severely threaten and damage the archaeological remains¹⁰. The expansion of modern coastal cities in Libya also poses serious threats to the cultural heritage in the region. Over 80% of Libya's population lives in the cities and towns situated in the coastal zone¹¹.

Furthermore, the recent conflict in Libya caused serious damage to historical cities, such as Benghazi, which suffered severe damage to its historical buildings. Consequently, cultural heritage in this zone is being lost at an alarming rate which highlights the critical need to document coastal and near-shore underwater heritage before it is lost.

Through a working partnership with EAMENA, the newly established project MarEA aims to document the coastal zones of the Middle East and North Africa. The main focus is on all coastal, near-shore and underwater sites visible from satellite images and recorded in extant documentation using the EAMENA database. A team of maritime archaeologists based at the University of Southampton (England) and Ulster University (Northern Ireland) specialize in the identification, documentation and interpretation of coastal and near-shore cultural features. The methodology mirrors the EAMENA regional scope but with a sole focus on documenting more comprehensively the dynamic coastal and near-shore underwater zone.

The MarEA project is building on the coastal documentation that has been previously achieved by the EAMENA team. In order to determine the nature and degree of threat, the MarEA team documents the changing nature of maritime archaeological sites. Furthermore, local to regional-scale sea-level change, sedimentary and erosional

processes provide a framework within which the team can identify and interpret coastal and underwater sites with respect to their location both past and present. The relationship of maritime sites to the sea is often dynamic and changeable over time and space, owing to the above-mentioned processes. A further component of the project includes targeted coastal and marine survey and ground-checking survey. Priority will be given to areas of imminent threat and/or high archaeological potential. A detailed programme of engagement with our existing networks and projects will be included in the initial stages of the MarEA work while also aiming to create new partnerships in the MENA region.

Acknowledgements

The EAMENA and MarEA projects are funded by the Arcadia Fund. The EAMENA-CPF training workshops are funded by the British Council's Cultural Protection Fund in partnership with the Department for Digital, Culture, Media & Sport. The EAMENA project is a collaboration between the universities of Oxford, Leicester and Durham, under the overall direction of Prof. Andrew Wilson and Dr Robert Bewley (Oxford), with co-investigators Prof. David J. Mattingly (Leicester) and Prof. Graham Philip (Durham). The MarEA project is a collaboration between the universities of Southampton and Ulster and is directed by Dr Lucy Blue (Southampton) and Dr Colin Breen (Ulster).

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¹⁰ BENNETT, BARKER 2011.

¹¹ See e.g. <http://worldpopulationreview.com/countries/libya-population/>.

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